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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,075	08/21/2003	Akiyoshi Aoyagi	81754.0097	9703

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HOGAN & HARTSON L.L.P.
500 S. GRAND AVENUE
SUITE 1900
LOS ANGELES, CA 90071-2611

EXAMINER	
IM, JUNGHWA M	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,075	AOYAGI, AKIYOSHI	
	Examiner	Art Unit	
	Junghwa M. Im	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *9-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-8 in the reply filed on August 02, 2004 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 6 recite a limitation of "a surface of the first substrate ... has a rectangular shape ... and a surface of the second substrate ... has a rectangular shape." Note that the instant invention discloses that the first and the second substrates are bent with openings, therefore, the first and the second substrates do not have a rectangular surface.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomita (US 6084294).

Regarding claim 1, Fig. 2 of Tomita shows a semiconductor device comprising:

a base substrate provided with a base wiring [14; a mother board];

a first substrate [a lower 3] that includes a first wiring [a lower 4] to be electrically connected to the base wiring, and is provided above the base substrate;

a first semiconductor element [a lower 1] that is provided between the base substrate and the first substrate;

a second substrate [a upper 3] that includes a second wiring [a upper 4] to be electrically connected to the base wiring, and is provided above the first substrate; and

a second semiconductor element [a upper 1] that is provided between the first substrate and the second substrate and above the first semiconductor element,

wherein the first substrate [a lower 3] has a first region where the first semiconductor element [a lower 1] is provided below, a second region where a portion of the first wiring that connects to the base wiring is located, and a first bent section between the first region and the second region, and

the second substrate [a upper 3] has a third region where the second semiconductor element [a upper 1] is provided below, a fourth region where a portion of the second wiring that connects to the base wiring is located, and a second bent section between the third region and the fourth region.

Regarding claim 2, Fig. 2 of Tomita shows a first electrode [a lower 5] that is provided on the first semiconductor element and a second electrode [a upper 5] that is provided on the

second semiconductor element, wherein the first electrode is electrically connected to the first wiring, and the second electrode is electrically connected to the second wiring.

Regarding claim 3, Fig. 2 of Tomita shows a surface of the first semiconductor element [1 on the left in Fig. 4] that includes the first electrode [2 in Fig. 4] has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side and a surface of the second semiconductor element [1 on the right in Fig. 4] that includes the second electrode [2 in Fig. 4]has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first semiconductor element and the second semiconductor element are disposed such that the second side and the fourth side are in parallel with each other.

Regarding claim 5, insofar as understood, Fig. 4 of Tomita shows a surface of the first substrate [3' on the left] that opposes a surface of the base substrate has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side, and a surface of the second substrate [3' on the left] that opposes a surface of the base substrate has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first substrate and the second substrate are disposed such that the second side and the fourth side are in parallel with each other.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of De Givry (US 5229960).

Regarding claim 4, Fig. 2 of Tomita shows the most aspect of the instant invention except "a surface of the first semiconductor element that includes the first electrode has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side and a surface of the second semiconductor element that includes the second electrode has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first semiconductor element and the second semiconductor element are disposed such that the second side and the fourth side projected onto the base substrate intersect each other." Fig. 1 of De Givry shows an arrangement of two semiconductor devices wherein "a surface of the first semiconductor element [14] that includes the first electrode has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side and a surface of the second semiconductor element [16] that includes the second electrode has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first semiconductor element and the second semiconductor element are disposed such that the second side and the fourth side projected onto the base substrate intersect each other."

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of De Givry into the device of Tomita in order to have two semiconductor devices stacked in a manner recited in the instant invention to reduce the chip packaging size.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of Kamei et al. (US 6462412), hereinafter Kamei.

Regarding claim 6, insofar as understood, Fig. 2 of Tomita shows the most aspect of the instant invention except "a surface of the first substrate that opposes a surface of the base substrate has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side and a surface of the second substrate that opposes a surface of the base substrate has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first substrate and the second substrate are disposed such that the second side and the fourth side projected onto the base substrate intersect each other." Fig. 2 of Kamei shows a semiconductor with the flexible substrate [2] wherein a surface of the first substrate [11, 13, 61, 63] that opposes a surface of the base substrate has a rectangular shape including a first side and a second side that is longer than the first side and intersects the first side and a surface of the second substrate [12, 50, 62, 64] that opposes a surface of the base substrate has a rectangular shape including a third side and a fourth side that is longer than the third side and intersects the third side, wherein the first substrate and the second substrate are disposed such that the second side and the fourth side projected onto the base substrate intersect each other.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Kamei into the device of Tomita in order to have two flexible substrates arranged in a manner recited in the instant invention to improve the reliability of the device.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita in view of Hashimoto (US 6383840).

Regarding claim 7, Fig. 2of Tomita shows the most aspect of the instant invention except "an opening section is formed in the first substrate at the first bent section." Fig. 12 of Hashimoto shows an opening section [114] is formed in the first substrate [10] at the first bent section [16].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Hashimoto into the device of Tomita in order to have an opening section formed in the first substrate at the first bent section for a compact package size.

Regarding claim 8, Fig. 2of Tomita shows the most aspect of the instant invention except "an opening section is formed in the first substrate at the first bent section." Fig. 12 of Hashimoto shows an opening section [114] is formed in the second substrate [110] at the second bent section [16].

The motivation of combining two teachings of Tomita and Hashimoto has been stated above in claim 7.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (571) 272-1655. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmi

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800